TETRA TECH, INC.

April 7, 2006

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: **Quality Assurance Project Plan**
Integrated Site Assessment of the United Zinc #1 Site, Iola, Kansas
U.S. EPA Region 7 START, Contract No. EP-S7-06-01, Task Order No. 0011.000
Task Monitor: Eddie McGlasson, On-Scene Coordinator

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the attached Quality Assurance Project Plan for an integrated removal site evaluation and preliminary assessment of the United Zinc #1 site. If you have any questions or comments, please contact the Tetra Tech START Project Manager, at (913) 908-4649.

Sincerely,

for

Rick Claytor, CHMM
START Project Manager

Ted Faile, PE, CHMM
START Program Manager

Enclosures

X9004/0011

8030 Flint Street, Lenexa, KS 66214
Tel 913.894.2600 Fax 913.894.6295

QUALITY ASSURANCE PROJECT PLAN
FOR AN INTEGRATED SITE ASSESSMENT OF THE
UNITED ZINC #1 SITE
IOLA, ALLEN COUNTY, KANSAS

Superfund Technical Assessment and Response Team (START) Contract
Contract No. EP-S7-06-01, Task Order 0011

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
901 N. 5th Street
Kansas City, Kansas 66101

April 7, 2006

Prepared By:
Tetra Tech EM Inc.
8030 Flint Street
Lenexa, Kansas 66214
913-894-2600

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Region 7 Superfund Program
Quality Assurance Project Plan Form
for the United Zinc #1 Site

Project Information:

Site Name: United Zinc #1 Site		City: Iola	**State:** Kansas
EPA Project Manager: Eddie McGlasson		**START Project Manager:** Rick Claytor	
Approved By:		**Prepared For:** EPA Region 7 Superfund Division	
Title: for START Project Manager	**Date:** 4/7/06		
Approved By:			
Title: START Program Manager	**Date:** 4/7/06		
Approved By: Kathy Homes	4/7/06	**Prepared By:** Rick Claytor **Date:** April 3, 2006	
Title: START QA Manager	**Date:**		
Approved By: Kate A. Miller for Eddie McGlasson			
Title: EPA Project Manager	**Date:** 6/1/06		
Approved By:		**Tetra Tech START Project Number:** X9004.06.0011.000	
Title: EPA QA Coordinator	**Date:**		

1.0 Project Management:

1.1 Distribution List

EPA—Region 7: Eddie McGlasson, Project Manager
Diane Harris, QA Coordinator

Tetra Tech START: Rick Claytor, Project Manager

1.2 Project/Task Organization

Eddie McGlasson, of the EPA Region 7 Superfund Division, will serve as the EPA project manager for the activities described in this QAPP. Rick Claytor, of Seagull Environmental Technologies, Inc. (SETI), will serve as the START project manager for field activities.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the **Generic Quality Assurance Project Plan for Superfund Integrated Assessment Activities, November 1998,** and contains site-specific data quality objectives for the sampling activities described herein.

☒ Description attached.
☐ Description in referenced report: _____ _____
Title **Date**

1.4 Project/Task Description:

☒ CERCLA PA ☐ CERCLA SI ☐ Brownfields Assessment
☐ Other (description attached): ☐ Pre-CERCLIS Site Screening ☒ Removal Assessment

Other Description:

Schedule: Field work is scheduled to begin on April 11, 2006, and is anticipated to last about six weeks.

☐ Description in referenced report: _____

1.5 Quality Objectives and Criteria for Measurement Data:

a. Accuracy:	☐ Identified in attached table.
b. Precision:	☐ Identified in attached table.
c. Representativeness:	☐ Identified in attached table.
d. Completeness*:	☐ Identified in attached table.
e. Comparability:	☐ Identified in attached table.

Other Description:

*A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make site decisions based on any or all of the remaining validated data. Soil and groundwater samples collected from residential properties will be considered "critical samples" because the results are crucial to accurately assess the overall threat(s) posed by the site.

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for the United Zinc #1 Site

Project Information:

1.6 Special Training/Certification Requirements:

☒ OSHA 1910 ☒ Special Equipment/Instrument Operator (describe below): ☐ Other (describe below):
Along with the training listed above, familiarization with a Niton™ x-ray fluorescence spectrometer and its operating procedures will be necessary for the Tetra Tech START team.

1.7 Documentation and Records:

☒ Field Sheets ☒ Site Log ☒ Trip Report ☒ Site Maps ☐ Video
☒ Chain of Custody ☒ Health and Safety Plan ☒ Letter Report ☒ Photos

☒ Sample documentation will follow EPA Region 7 SOP 2420.05D.
☒ Other: Analytical information will be handled according to procedures identified in Table 2.

2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ☒ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☒ Definitive Sampling
☐ Screening w/o Definitive Confirmation ☒ Screening w/ Definitive Confirmation
☒ Sample Map Attached

☐ Other (Provide rationale behind each sample): See Attachment A for additional sampling information.

The proposed sampling scheme will be judgmental, in accordance with the *Guidance for Performing Site Inspections Under CERCLA*, OSWER Directive #9345.1-05, September 1992, and *Removal Program Representative Sampling Guidance, Volume 1: Soil*, OSWER Directive 9360.4-10, November 1991. Judgmental sampling is the subjective (biased) selection of sampling locations based on historical information, visual inspection, and the best professional judgment of the sampler(s). See Appendices A and B for additional site-specific information and site maps.

Soil screening and sampling for laboratory confirmation analysis will be conducted in accordance with *Superfund Lead-Contaminated Residential Sites Handbook*, OSWER 9285.7-50, August 2003. Groundwater samples will be collected for laboratory analysis from any drinking water wells located at properties where soil screening is conducted. Exact sample locations will be determined during reconnaissance activities performed in the field. The proposed number of samples is a balance between cost and coverage, and represents a reasonable attempt to meet the study objectives while staying within the budget constraints of a typical site investigation.

Sample Summary Location	Matrix	# of Samples*	Analysis
Residential yards, parks, school yards, daycare centers	Soil	180	arsenic, zinc, cadmium, lead
Private drinking water wells	Water	10	arsenic, zinc, cadmium, lead (total)

*NOTE: Background/QC samples are not included with these totals. See Table 1 for a complete sample summary. The estimate of 180 soil samples is based on an assessment of 300 properties, with six samples collected from each property, yielding 1,800 samples for field screening. Ten percent of the screened samples would yield 180 samples for laboratory confirmation analysis.

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2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA SOP(s)
Soil	Surface soil samples will be collected with disposable stainless steel spoons and field-screened with a XRF. Approximately 10 percent of the samples will be submitted for laboratory confirmation analysis.	4231.1707, 4231.2012
Water – Private drinking water wells	Drinking water samples will be collected directly into sample containers from taps or spigots closest to the well head and submitted for laboratory analysis.	4230.10A

☐ Other Description:

2.3 Sample Handling and Custody Requirements:

☒ Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06D.
☒ COC will be maintained as directed by Region 7 EPA SOP 2420.04C.
☒ Samples will be accepted according to Region 7 EPA SOP 2420.01D.

☐ Other (Describe):

2.4 Analytical Methods Requirements: ☒ Identified in attached table.

☒ Rationale: The requested analyses have been selected based on historic information about the site and program experience with similar types of sites.

☐ Other (Describe):

2.5 Quality Control Requirements: ☐ Not Applicable ☒ Identified in attached table.

☒ Field QC Samples: For this investigation, field QC samples will include one water field blank prepared with DI water provided by EPA Region 7 laboratory. The field blank will be collected to evaluate contamination of sampling containers and/or preservatives, and to assess contamination potentially introduced during the sampling procedure(s). In addition, 18 field duplicate soil samples and one duplicate drinking water sample will be collected to evaluate total method precision. All QC samples will be submitted for the analyses listed in the attached tables. Evaluation of the blank sample will depend on the levels of contamination found in environmental samples to determine whether the environmental samples are representative. Analytical results of the blank sample will be evaluated qualitatively by the EPA project manager and EPA contractor(s) for a general indication of field-introduced and/or lab-introduced contamination. Relative percent differences among duplicate samples will be calculated to determine the total method precision for the sampled matrices.

☐ Other (Describe):

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements: ☐ Not Applicable

☒ Testing, inspection, and maintenance of analytical instrumentation will proceed in accordance with the previously referenced SOPs and/or manufacturers' recommendations.

☒ Other (Describe): Testing, inspection, and maintenance of field instruments (GPS units, Niton™ XRF, etc.) will proceed in accordance with manufacturers' recommendations.

2.7 Instrument Calibration and Frequency: ☐ Not Applicable

☒ Calibration of laboratory equipment will proceed as described in the previously referenced SOPs and/or manufacturers' recommendations.

☒ Other (Describe): Calibration of field instruments will follow the manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables: ☐ Not Applicable

☒ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers.*

☐ Other (Describe):

2.9 Data Acquisition Requirements: ☐ Not Applicable

☒ Previous data or information pertaining to the site (including other analytical data, reports, photos, maps, etc., that are referenced in this QAPP) has been compiled by EPA and/or its contractor(s) from other sources. Some of that data have not been verified by EPA and/or its contractor(s); however, that unverified information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data or information.

☐ Other (Describe):

2.10 Data Management:

☒ All laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.01D.

☐ Other (Describe):

3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

☒ Peer Review ☒ Management Review ☐ Field Audit ☐ Lab Audit

☒ Assessment and response actions pertaining to analytical phases of the project are addressed in Region 7 EPA SOPs 2430.05C and 2430.12E.

☐ Other (Describe):

3.1A Corrective Action:

☒ Corrective actions will be at the discretion of the EPA project manager whenever problems appear that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.

☐ Other (Describe):

3.2 Reports to Management:

☐ Audit Report ☐ Data Validation Report ☐ Project Status Report ☐ None Required

☒ A letter report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be prepared by START and submitted to the EPA.

☐ Other (Describe):

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4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements: ☐ Identified in attached table.

☒ Data review and verification will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.05C and 2430.12E.

☐ Other (Describe):

4.2 Validation and Verification Methods: ☐ Identified in attached table.

☒ The data will be validated in accordance with Region 7 EPA SOPs 2430.05C and 2430.12E.

☒ The EPA project manager will inspect the data to provide a final review. The EPA project manager will review the data, if applicable, for laboratory spikes and duplicates, laboratory blanks, and field blanks to ensure the data are acceptable. The EPA project manager will also compare the sample descriptions with the field sheets for consistency, and will ensure appropriate documentation of any anomalies in the data.

☐ Other (Describe):

4.3 Reconciliation with User Requirements:

☒ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling or re-analysis of the subject samples may be required by the EPA project manager.

☐ Other (Describe):

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for the United Zinc #1 Site

Table 1: Sample Summary

Site Name: United Zinc #1 Site	**Location:** Iola, Allen County, Kansas; see Figure 1.	
START Project Manager: Rick Claytor	**Activity/ASR #:** To be determined	**Date:** 04/03/2006

No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Methods	Analytical Method
180	Soil	Residential yards, school yards, parks, daycare centers	to confirm XRF readings obtained in the field	0-2 inches	arsenic, cadmium, zinc, lead	EPA SOPs 4231.1707 & 4231.2012	EPA Method 3050B/6010B
10	Water	Private drinking water wells in the study area	to determine whether a release to drinking water supplies has occurred	N/A	arsenic, cadmium, zinc, lead (total)	EPA SOP 4230.10A	EPA Method 6020
QC Samples							
18	Soil	Field duplicates – soil sampling locations	to assess the precision of analytical and sampling methods	0-2 inches	arsenic, cadmium, zinc, lead	EPA SOPs 4231.1707 & 4231.2012	EPA Method 3050B/6010B
1	Water	Field duplicate – private drinking water well	to assess the precision of analytical and sampling methods	N/A	arsenic, cadmium, zinc, lead (total)	EPA SOP 4230.10A	EPA Method 6020
1	Water	field blank	to assess field-introduced and lab-introduced contamination	N/A	arsenic, cadmium, zinc, lead (total)	N/A	EPA Method 6020
Background Samples							
3	Soil	Outside suspected influence of former smelter operations	To determine background levels in soil for the contaminants of concern	0-2 inches	arsenic, cadmium, zinc, lead	EPA SOPs 4231.1707 & 4231.2012	EPA Method 3050B/6010B
1	Water	Private well upgradient of study area	To determine background levels in groundwater for the contaminants of concern	N/A	arsenic, cadmium, zinc, lead (total)	EPA SOP 4230.10A	EPA Method 6020

Table 2: Data Quality Objective Summary

Site Name: United Zinc #1 Site	**Location:** Iola, Allen County, Kansas; see Figure 1.	
START Project Manager: Rick Claytor	**Activity/ASR #:** To be determined	**Date:** 04/03/2006

Analysis	Analytical Method	Data Quality Measurements					Sample Handling Procedures	Data Management Procedures
		Accuracy	Precision	Representativeness	Completeness	Comparability		
SOIL								
arsenic, cadmium, zinc, lead	see Table 1	per analytical method	per analytical method	judgmental sampling based on professional judgment	100%; samples from residential properties are critical samples	standardized procedures for sample collection and analysis will be used	see Section 2.3 of QAPP form	see Section 2.10 of QAPP form
WATER								
arsenic, cadmium, zinc, lead (total)	see Table 1	per analytical method	per analytical method	judgmental sampling based on professional judgment	100%; samples from private drinking water wells are critical samples	standardized procedures for sample collection and analysis will be used	see Section 2.3 of QAPP form	see Section 2.10 of QAPP form

APPENDIX A

SITE-SPECIFIC INFORMATION FOR AN INTEGRATED SITE ASSESMENT OF THE UNITED ZINC #1 SITE

INTRODUCTION

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has been tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to conduct an integrated removal site evaluation and preliminary assessment (i.e., integrated site assessment [ISA]) at the United Zinc #1 site. From 1902 until 1912, the United Zinc and Chemical Company utilized the site for lead and zinc smelting and processing operations. The purpose of this investigation is to evaluate whether any threats to human health or the environment exist because of possible impacts of these activities on surface soils and groundwater.

The ISA will include collection of the following samples: surface soil samples from residential yards, schoolyards, and daycare centers; and groundwater samples from private wells. This Quality Assurance Project Plan (QAPP) identifies site-specific features and addresses elements of the sampling strategy and analytical methods proposed for this investigation. An analysis of the data acquired during this project will proceed according to 40 CFR 300.410 to determine the need for a removal action, and 40 CFR 300.420 to address pre-remedial issues, as specified in the National Oil and Hazardous Pollution Contingency Plan (NCP).

SITE LOCATION/DESCRIPTION

The site is located in a mixed residential and commercial area on the east side of Iola, Kansas (see Appendix B, Figure 1). The initial study area will target a 0.25-mile radius around the former United Zinc and Chemical Company property. The United Zinc #1 site covers approximately 17 acres, much of which is now vacant. Businesses currently on the site include: Brentagg Southwest, Inc., MFA, Superflea Flea Market, Tucker's Flea Market, and a portion of a concrete plant.

PREVIOUS INVESTIGATIONS

Under the Kansas Department of Health and Environment's (KDHE) State Water Plan (SWP) program, a Phase I Focused Former Smelter Assessment was completed at the United Zinc #1 site in December 2003. The assessment identified the site as a potential source of heavy metals contamination due to the historical activities at the site. In December 2004, a KDHE contractor conducted a Phase II assessment at the site and identified elevated concentrations of lead, cadmium, arsenic, and zinc on the former United Zinc and Chemical Company property. Concentrations of those metals were detected as high as 49,000 milligrams per kilogram (mg/kg) for lead, 380 mg/kg for cadmium, 1,800 mg/kg for arsenic, and 52,000 mg/kg for

zinc. The assessment also identified the potential for elevated levels of lead on nearby residential, school, and day care properties.

In June 2005, KDHE screened the right-of-ways of 50 residential properties around the United Zinc #1 site. Discrete surface soil samples were collected at each property and analyzed (using both field screening and laboratory methods) for lead, arsenic, cadmium, and zinc. The results of this investigation identified lead-contaminated surface soils (i.e., exceeding 400 mg/kg) at 36 percent of the properties. Relative concentrations of the other metals of concern typically mimicked the lead levels.

In September 2005, a Preliminary Removal Site Evaluation was conducted by a KDHE contractor at sensitive receptor areas identified during previous investigations. This involved the collection of discrete soil samples from the McKinley Elementary School and the Iola Preschool. Lead concentrations greater than 400 mg/kg were identified in soils on and adjacent to the McKinley Elementary School property; however, no elevated concentrations of metals were found in the samples collected from the Iola Preschool.

SAMPLING STRATEGY AND METHODOLOGY

In support of EPA, under this task order, Tetra Tech START will conduct sampling at properties in Iola, Kansas, to determine the extent of metals contamination in surface soils and groundwater. The extent of contamination will be further refined as additional screening and analytical data become available.

Sampling procedures will follow standard operating procedures (SOP) outlined in the QAPP. In addition, soil sampling and screening activities will be conducted in accordance with the guidelines established in the Superfund Lead-Contaminated Residential Sites Handbook. Sampling activities will require four to five START personnel and will include collection of surface soil samples and groundwater samples from private wells, if any are located in the study area. Properties within 0.25 mile of the former United Zinc and Chemical Company property will be initially targeted for sampling. Descriptions of the sampling strategy and procedures are presented below.

Soil Sampling and Field Screening – The Tetra Tech START crew will conduct soil sampling and field screening activities at approximately 300 residential properties, schoolyards, parks, and daycare centers. At each property, after receiving consent from the owner, Tetra Tech START will divide the property into distinct cells for screening purposes. While the maximum size of a cell will be 100 by 100 feet, the actual size of cells will be determined in the field based on site features. A cell will extend from the circumference defined by the drip zone around the building or house in all directions 100 feet or to the

property line, whichever distance is shorter. Additional areas or cells to be screened include: the drip zone; fine-grained material if used for driveways, sidewalks, or under carports; vegetable gardens; and children's play areas at least 25 by 25 feet. A composite sample consisting of nine aliquots, each collected from 0 to 2 inches below ground surface (bgs), will be collected in each cell and placed in a labeled, sealed plastic bag. Three separate readings for the metals of interest will be taken of each homogenized sample using a field portable x-ray fluorescence (XRF) analyzer; these readings will be recorded in the appropriate cell on the field sheet for that property. The average of these three readings will be calculated and also recorded on the field sheet. Approximately 10 percent of the screened samples will be submitted for laboratory confirmation analyses of arsenic, zinc, cadmium, and lead. The XRF data will be considered valid if a comparison between the XRF values and the corresponding laboratory results yields a regression coefficient (r^2) of at least 0.7.

Private Drinking Water Well Samples – Most drinking water in the study area is supplied by Iola's municipal system. However, if any private drinking water wells are identified in the study area, Tetra Tech START will make every effort to sample these wells in accordance with the following procedures. Samples will be collected from taps or spigots near the wellheads and prior to any home treatment systems, wherever possible. The supply lines will be purged for 5 minutes before the samples are collected. Available well construction and aquifer data will be recorded on the field sheets. Water samples will be collected in 1-liter cubitainers and preserved with nitric acid at a pH less than 2. All water samples will be maintained at or below a temperature of 4 degrees Celsius (□C) and submitted to the laboratory for analyses of total arsenic, zinc, cadmium, and lead. For each sample from a private drinking water well, the following information will be included on the field sheet, if known: property owner information (name, address, and phone number); number and ages of persons using the well; well depth; depth to water; presence and type of treatment system; and sampling location.

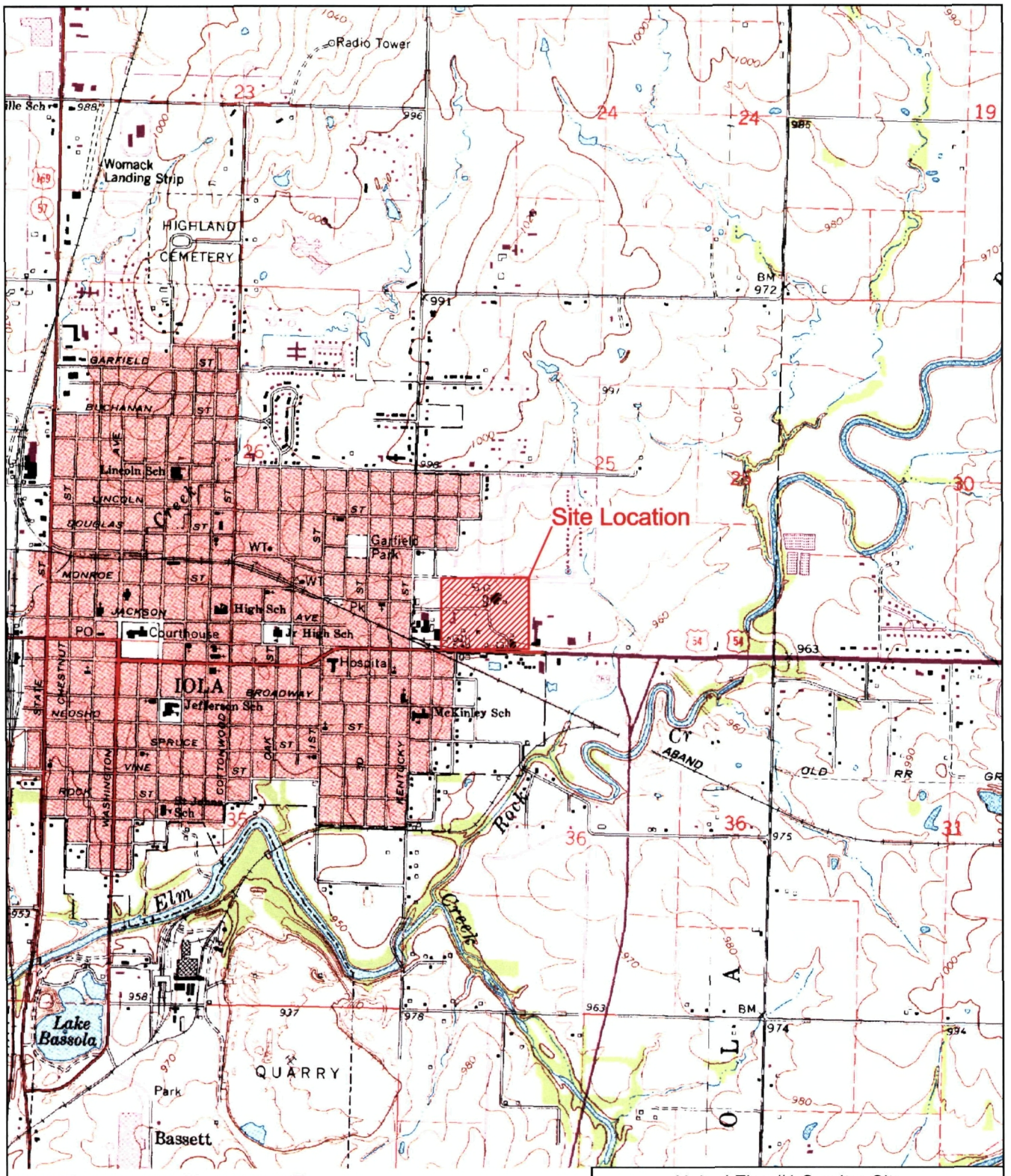
Quality Control Samples – Field duplicates will be collected of the sampled matrices (soil and drinking water) at a frequency of 10 percent of samples submitted for laboratory analysis. Data from these duplicate pairs will be evaluated to determine total method precision of field procedures and laboratory analyses. One field blank (water) will also be submitted for laboratory analysis to evaluate potential contamination introduced during the sampling and/or laboratory procedures. Background samples of surface soil and groundwater will be collected from locations determined to be outside the influence of former smelting activities conducted at the United Zinc #1 site. Proposed for this ISA are the collection of one background groundwater sample and three background soil samples from locations to be identified during the sampling activities.

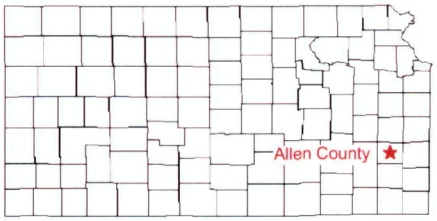
ANALYTICAL METHODS

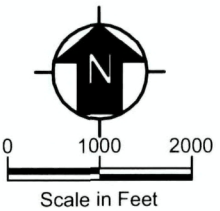
An Analytical Services Request (ASR) form will be completed by the EPA project manager and submitted to the EPA Region 7 laboratory prior to field activities. Appropriate containers and physical and chemical preservation techniques will be employed during the field activities to help verify acquisition of representative analytical results. All samples will be submitted to the EPA Region 7 laboratory in Kansas City, Kansas, for analyses of arsenic, zinc, cadmium, and lead, according to the SOPs and methods referenced or described in the QAPP form. As tentatively scheduled, START will periodically submit samples to the laboratory starting on April 14, 2006.

APPENDIX B

SITE AREA MAP







Source: USGS Allen County, KS 7.5 Minute Topo Quad, 1959, PR 1984

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United Zinc #1 Smelter Site
Iola, Kansas

Figure 1
Site Location Map

Tetra Tech EM Inc.

Date: 04/5/06 | Drawn By: Bill Spiking | Project No: 19004.L06.0011.000